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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,886	03/24/2006	Romolo Montanari	273332US0XPCT	8847
22850	7590	10/29/2008	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			NGUYEN, TAM M	
			ART UNIT	PAPER NUMBER
			1797	
			NOTIFICATION DATE	DELIVERY MODE
			10/29/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/538,886	<b>Applicant(s)</b> MONTANARI ET AL.	
	<b>Examiner</b> TAM M. NGUYEN	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/17/06; 3/24/06; 9/6/05; 6/14/05</u> .                       | 6) <input type="checkbox"/> Other: _____                          |



## **DETAILED ACTION**

### ***Specification***

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the stream containing asphaltenes" in lines 7-8. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "the mixture obtained" in line 9. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "the deasphalting unit" in line 8. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "the stream containing the hydrotreatment reaction product" in lines 11 and 19. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "the flash unit" in line 14. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "the different fractions" in lines 12-13. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "the distillation residue (tar)" in line 14. There is insufficient antecedent basis for this limitation in the claim.

The expression "possibly coke", in lines 16 of claim 1, in line 4 of claim 4, and in line 3 of claim 6 renders the claims indefinite because the expression includes element not actually disclose, thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

The expression "obtaining two streams" in line 17 of claim 1 renders the claim indefinite because it is unclear if the two streams come from the deasphalting zone. .

Claim 1 recites the limitation "the deasphalting zone" in line 16. There is insufficient antecedent basis for this limitation in the claim.

Claims 6, 7, and 9 recite the limitation "the deasphalting section" in line 5 of claim 6, in lines 4-5 of claim 7 and in line 3 of claim 9. There is insufficient antecedent basis for this limitation in the claims.

Claim 27 recites the limitation "the fresh feedstock" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 28, the phrase "such as" in line 2 renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

***Claim Rejections - 35 USC § 103***

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 4, 5, 10, 11, 13-20, and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marchionna et al. (US 5,923,090).

Marchionna discloses a process for the conversion of a heavy crude oil or distillation residues to distillates by mixing the heavy crude oil with a decomposable precursors hydrogenation catalyst comprising molybdenum and sending the mixture of the crude oil and

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catalyst to a hydrotreating zone in the presence of a mixture of hydrogen and  $H_2S$  to produce a stream comprising hydrocarbon product and catalyst in slurry phase. The stream is then passed into a distillation zone wherein light fractions are separated from a distillation residue. The residue is then sent to a deasphalting zone utilizing a solvent to produce a first stream consisting of deasphalted oil (DAO) and a second stream comprising asphaltenes, coke, metal, and the catalyst in slurry phase. Up to 100% of the second stream is then recycled back to the hydrotreating zone. The hydrogenation is operated at a temperature between 370 and 480° C and at a pressure between 30 and 300 atm (3 and 30 MPa). The deasphalting zone is operated at temperature between 40 and 200° C and at a pressure between 1 and 50 atm (0.1 to 5 MPa). A light paraffin having from 3 to 6 carbon atoms is used as a solvent. The distillation zone is carried out at a reduced pressure, so it would be in the claimed ranges. The example indicated that the concentration of the catalyst is about 3000 ppm. (See abstract; Figure 1; col. 1, lines 60-64; col. 2, line 19 through col. 3, line 15; 0-61;

Marchionna does not specifically teach that the product stream is subjected to a high pressure separator to obtain a light fraction and a heavy which is sent to the distillation step, and does not specifically disclose that the deasphalting step is carried out under subcritical or supercritical, and also does not disclose a step of fractionating the DAO stream in a conventional distillation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Marchionna by feeding the product stream from the hydrotreating zone to a high pressure separator to separate hydrogen and other light components from heavy components because it is within the level of one of skill in the art to use

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either a low pressure or a high pressure separator when certain components in the light fraction are desirable.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Marchionna by operating the deasphalting zone at either subcritical or supercritical conditions. It is within the level of one of skill in the art to operate the deasphalting zone of Marchionna at either subcritical or supercritical conditions because of the similarities between the claimed deasphalting conditions and the deasphalting conditions of Marchionna.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Marchionna by separating the DOA in a conventional distillation to recover the solvent from the DOA for reuse.

Claims 2 and 3 rejected under 35 U.S.C. 103(a) as being unpatentable over Marchionna et al. (US 5,923,090) as applied to claim 1 above, and further in view of van Klinken et al. (US 4,039,429)

The process of Marchionna is as discussed above.

Marchionna does not teach that the light fraction from the high pressure separator is sent to a second hydrotreating.

Van Klinken teaches a process for converting residual hydrocarbons into distillates wherein a product stream from a first hydrotreating zone is passed into a separation zone to produce a light fraction which is then sent to a second hydrotreating zone which is operated at a hydrogen partial pressure of from 20 to 75 bars (2- 7.5 MPa). With hydrogen/feed ratios from



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about 200 to 1500 NI/kg, it is estimated that the total pressure is within the claimed ranges. See abstract; Figure 1; col. 4, lines 13-23.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Marchionna by passing the light fraction from the high pressure separator to a second hydrotreating as suggested by van Klinken to further remove contaminants such as sulfur and nitrogen compounds to produce a purer light fraction.

Claims 26-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marchionna et al. (US 5,923,090) as applied to claim 1 above, and further in view of Taylor et al. (US 5,242,578)

The process of Marchionna is as discussed above.

Marchionna does not disclose a step of further treating the flushing stream with solvent as claimed, and does not disclose the amount of the flushing stream with respect to the fresh feedstock.

Taylor discloses a deasphalting process wherein the asphaltenes stream from the first solvent extraction is passed to a second solvent extraction zone. The ratio of solvent to feed is from about 3:1 to 20:1. See abstract; Figure 5, col. 9 line 58 through col. 10 lines 24.

Taylor does not teach that the solvent is toluene or xylene.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Marchionna by treating flushing stream 9 with solvent as taught by Taylor to enhance the recovery of valuable hydrocarbon from the asphalting stream.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Marchionna/Taylor by utilizing toluene or xylene as solvent because Taylor teaches that other solvent can be used and one of skill in the art would employ any solvent, which is effectively extracted liquid hydrocarbons from asphaltenes, including xylene or toluene. Also, it is within the level of one of skill in the art to further process the liquid hydrocarbons to produce distillates such as a fuel oil fraction or recycled the extracted liquid hydrocarbons back to hydrotreating zone to produce distillate products. Consequently, a solid fraction from the extracting step would comprise spent catalyst which would need to be treated to restore its activity before recycling back to the hydrotreating zone for reuse.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Marchionna by having a flushing stream in a quantity from 0.5 to 10% by volume with respect to the feedstock because Marchionna teaches the flushing stream is a part of stream 7 and a large quantity of stream 7 is recycled back to the hydrotreating zone. One of skill in the art would have a flushing stream in any small quantity including the claimed quantity.

Claims 1, 6, 7, 8, 9, 12-16, 18, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Douce (US 2,559,285) in view of Marchionna (US 5,923,090)

The Douce reference discloses a process for treating hydrocarbons. The process comprises charging a heavy oil to a propane deasphalting zone wherein the oil is counter-currently contacted with propane in liquid phase at a temperature in the range of 130° to 190°F (54° to 88°C). A deasphalted oil stream and an asphaltic residue stream are recovered from the deasphalting zone. The deasphalted oil is subjected to a separation step to remove the propane

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from the deasphalted oil. The asphaltic residue stream is then passed to a hydrotreating zone where, in the presence of a catalyst and hydrogen, the residue stream is hydrotreated.

Hydrotreating conditions include temperatures ranging from 800 to 950°F (426 to 510°C) and pressures ranging from 1500 to 5000 psi (10 to 34 MPa). The effluent from the hydrotreating zone is passed to a separation zone where the effluent is separated into various fractions. Residue fractions are recycled to both the deasphalting and hydrotreating zones. A clean fraction is mixed with the deasphalted oil. See column 3, line 44 through column 4, line 59 and the Figure.

The Douce reference does not disclose a step of passing the product stream from the hydrotreating zone to a high pressure separation zone, does not disclose sending one fraction of the heavy charge to the deasphalting zone and sending another fraction of the heavy charge with the asphalt and catalyst to the hydrotreatment reactor, does not disclose the mixing of the asphalt with a hydrogenation catalyst and then sending this mixture to the hydrotreating zone, and does not disclose the distillation conditions, and also does not specifically teach that the separator which fractionating the DOA is a distillation separator.

The process of Marchionna is as discussed above.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Douce by passing the hydrocarbon product stream from the hydrotreating zone to a high pressure separator to separate hydrogen and other light components from heavy components because it is within the level of one of skill in the art to use either a low pressure or a high pressure separator when certain components in the light fraction are desirable.

It also would have been obvious to one having ordinary skill in the art to add the catalyst to the asphalt fraction as suggested by Marchionna to prolong the catalyst activity.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Douce by sending a portion of feed to the hydrotreatment zone because Douce discloses that heavy fractions are passed to the hydrotreatment zone along with the asphalt to dilute the asphalt and reduce carbon deposition on the catalyst. Since the heavy feed of Douce is physically and chemically similar to the heavy fraction passed to the hydrotreatment zone, one having ordinary skill in the art would expect the same advantages to result if a portion of the heavy feed were passed to the hydrotreatment zone instead of the heavy fraction disclosed by Douce.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized vacuum distillation conditions in the process of Douce as suggested by Marchionna because Marchionna discloses that vacuum distillation conditions effectively separate the hydroconverted product to recover various fractions.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Douce by utilizing a distillation separator to fractionate the DOA stream because one of skill in the art would utilize any type of separator that is effective to separate solvent from the DOA including a distillation separator.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAM M. NGUYEN whose telephone number is (571)272-1452. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tam M. Nguyen  
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